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Ego involvement moderates the assimilation effect of affective expectations

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Abstract Based on the affective expectations model and research on mental effort mobilization, two experiments manipulated affective expectations (no expectations versus positive expectations) and ego involvement (low versus high) and assessed participants' affective reactions to hedonically neutral stimuli. In Experiment 1, evaluations were more positive when participants had positive expectations about neutral photos—but only when ego involvement was low. High ego involvement neutralized this affective expectation assimilation effect. Experiment 2 replicated these findings for experienced mood after reading a hedonically neutral short essay. Furthermore, high ego involvement led to longer response latencies in the affect ratings in Study 1. The findings support the idea that high ego involvement resulted in relatively high mental effort that was necessary to detect discrepancies between affective expectations and stimuli's real affective potential and therefore moderated the assimilation effect to affective expectations.

Keywords Affective expectations · Ego involvement · Mental effort

Introduction

In their affective expectations model (AEM), Wilson and Klaaren (1992) posit that "people's predictions about how they will feel in a particular situation or toward a specific stimulus" will most frequently result in affective assimilation effects—that is, congruency between anticipated and experienced affect. Assimilation to affective expectations occurs when people are not aware of existing discrepancies between their anticipation and stimuli's actual affective potential—for example, their "true" valence. For the rare case that individuals notice a discrepancy between their anticipations and reality, the AEM predicts that their affective reactions are contrasted away from the expectations.

In a typical study conducted in the context of the AEM, participants are confronted with stimuli, like pictures, descriptions, or films, and indicate their affective reactions to them (see Wilson and Klaaren 1992). Expectations are usually manipulated via verbal information about those stimuli—the experimenter indicates, for example, how other participants have reacted to the stimuli (e.g., Wilson et al. 1989). Processing effort—as a means of making discrepancy detection more likely—is usually manipulated via direct instructions how to process the stimuli: Participants are asked to make repeated evaluations of the stimuli (e.g., Wilson et al. 1989), or to unitize the material (e.g., Geers and Lassiter 1999). More recent studies have also operationalized processing effort as an individual difference variable, via participants' scores in questionnaires measuring need for cognition (e.g., Geers and Lassiter 2003) or optimism (e.g., Geers and Lassiter 2002). Based on the AEM, these studies tested the hypothesis that participants in the low processing effort condition would assimilate their affective reactions to the manipulated affective expectation (i.e., positive affective reactions in the case of positive expectations, negative affective reactions in the case of negative expectations), while participants in the high processing effort condition would show affective contrast effects (i.e., negative affective reactions in the case of positive expectations, positive

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affective reactions in the case of negative expectations). Whereas evidence for affective contrast effects due to high processing effort is mixed (Wilson and Klaaren 1992) though existent (e.g., Geers and Lassiter 1999, 2002, 2003), affective assimilation is a robust, well replicated phenomenon (e.g., Klaaren et al. 1994; Lee et al. 2006). Moreover, assimilated affective reactions to stimuli like cartoons or films occur relatively fast—an indicator of superficial, low-effort stimulus processing (Wilson et al. 1989). These findings have been obtained in studies using different types of affective stimuli and samples including both women and men as participants.

However, there are two possible points of critique on previous AEM studies: First, previous studies have applied relatively obtrusive manipulations for evaluating effort with high demand characteristics (instructed unitization, repeated evaluations). Second, a number of studies were run in correlational designs that are less conclusive than controlled experiments. The role of motivational states in the mobilization of processing effort remained unclear. In the present experiments, we aimed to resolve these issues by manipulating a motivational variable—the level of ego involvement. This variable does not only refer to participants' motivational state during the processing of potentially affective stimuli; it is also an *indirect* manipulation of the motivation of processing effort because it does not directly ask or imply more scrutinized processing of the affective stimuli.

Ego involvement refers to situations in which "important ego factors, e.g., social prestige, self-esteem, fear of academic standing, are closely bound up in the tasks, and where, because of this, performance is of more vital consequence to the subjects" (Klein and Schoenfeld 1941, p. 249). In more recent research, ego involvement has been manipulated by making individuals' self-esteem contingent upon a performance outcome—which is typically the case in tests of important abilities (e.g., Ryan 1982). The motivational consequence is that high ego involvement frames situations as important for the individual and therefore justifies the mobilization of relatively high mental effort. In support of this idea, a series of experiments from our laboratory with objective, physiological measures of resource mobilization has shown that high ego involvement indeed *justifies* the mobilization of high mental effort in information processing. In support of the predictions of motivational intensity theory (Brehm and Self 1989; Wright 1996), we found that high ego involvement resulted in the mobilization of high mental effort and more accurate performance in learning and attention tasks when participants were confronted with difficult challenges or were asked to "do their best" (Gendolla 1999; Gendolla and Richter 2005, 2006). Referring to the AEM, this suggests that high ego involvement should result in high processing effort in affective evaluation tasks. Consequently, high ego involvement should significantly reduce the assimilation of experienced affect to anticipated affect and thus render affective contrast effects more likely.

The present experiments

Participants were presented with hedonically neutral stimuli—photos from the International Affective Picture System (IAPS; Lang et al. 2001) or an essay (Kishon 1976)—with versus without positive affective expectations. Simultaneously, ego involvement was manipulated to be high (important test) versus low (filler task). We manipulated only positive expectations, because stimuli that are expected to be negative can elicit automatic affect regulation strategies that are counteractive to the assimilation process (Taylor 1991). In accordance with the AEM, we predicted (1) affective assimilation to the positive expectation when ego involvement was low. However, given its effect on effortful information processing, we anticipated (2) that high ego involvement would significantly reduce this effect, making affective contrast likely. Moreover, we anticipated (3) that the more effortful stimulus evaluation in the high ego involvement condition would become visible in longer processing latencies.

Experiment 1: Picture evaluations

Participants watched and evaluated a series of hedonically neutral IAPS pictures. We restricted the investigated sample to women, because there are significant gender differences in affective reactions to IAPS pictures (Lang et al. 2001) and women were more accessible as participants at the time the study was run.

Method

Participants and design

Forty University students with different majors (all women, average age 24 years) participated voluntarily and were randomly assigned to a 2 (ego involvement: low vs. high) × 2 (expectation: no-expectation versus positive expectation) between-persons design. All participants received a small monetary reward corresponding to 4 USD.

Materials and procedure

The experimental procedure was computerized. After having provided written informed consent and biographical

data, participants in the *high-ego-involvement* condition were presented with a computer screen showing the University logo and the header "GTS-VP—Geneva Test System for Visual Perception." The next screen gave the bogus information that the study would be a test of perceptual abilities, ostensibly a predictor of individuals' fast and efficient adaptation to situational changes and of important social competencies. Participants read further that they would be presented with a series of photos to assess their personal perceptual ability. By contrast, participants in the *low-ego-involvement* condition did not see the logo with the header, but only read that they would see a series of photos for testing stimulus material to be used in a later study. Subsequently, the affective expectation manipulation followed. The experimenter entered the laboratory to start the picture presentation on the computer. In the *positive-expectation* condition, she looked at a sheet and mentioned "By the way, you are lucky—most other participants have experienced the pictures in your condition as pleasant" before she started the presentation. In pretests, this oral information had proven high efficiency for manipulating a positive affective expectation without raising suspicion. In the *no-expectation* condition the experimenter started the presentation without mentioning anything. Then the computer program presented 12 hedonically neutral IAPS pictures (each picture for 10 s).[1] After the presentation, participants made hedonic evaluations of the entire series of pictures—the dependent variable. Participants answered the questions "To what extent did you find the pictures pleasant", "How do you evaluate the pictures concerning their esthetics," and "To what extent did the pictures please you?" on scales ranging from *not at all* (1) to *very much* (7) by mouse clicks on visual rating scales. Additionally, the experimental software registered response latencies for the ratings—the time between item onset and response entering. Finally, participants were debriefed and received their payment.

Results and discussion

Hedonic evaluations

The highly correlated evaluation ratings were averaged to an evaluation index (Cronbach's $\alpha = 0.86$). A 2 (ego involvement) × 2 (expectation) between-persons ANOVA revealed a marginally significant expectation main effect, $F(1,36) = 3.95$, $p = 0.054$, $\eta^2 = 0.10$, indicating more positive evaluations in the positive than in the no-expectation condition (Ms = 5.27 vs. 4.67). This effect was moderated by the expected significant interaction, $F(1,36) = 5.38$, $p < 0.03$, $\eta^2 = 0.13$. Figure 1 shows that evaluations in the low-ego-involvement/positive-expectation condition ($M = 5.63$, $SD = 0.99$) were significantly more positive than in the low-ego-involvement/no-expectation cell ($M = 4.33$, $SD = 1.09$), $t(36) = 3.05$, $p < 0.004$, $r = 0.45$, reflecting affective assimilation. But when ego involvement was high, the no-expectation ($M = 5.00$, $SD = 0.98$) and the positive-expectation cells ($M = 4.90$, $SD = 0.70$) did not differ ($p > 0.50$, $r = 0.03$), indicating expectation neutralization. Thus, although the cell means did not show a net contrast effect, they clearly indicate that high ego involvement neutralized the expectation effect.

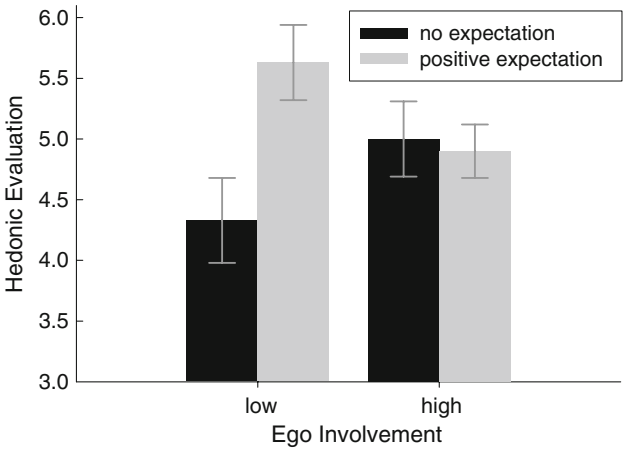

Fig. 1 Cell means and standard errors of the picture evaluations in the conditions of Experiment 1. Higher mean values indicate more positive hedonic evaluations

Response latencies

A 2 × 2 ANOVA of participants' average response latencies of their evaluations (normally distributed and thus not transformed) revealed only the anticipated ego involvement main effect, $F(1,36) = 5.65$, $p < 0.03$, $\eta^2 = 0.14$. As expected, responses in the high-ego-involvement condition ($M = 6751$ ms, $SD = 2260$) were slower than in the low-ego-involvement condition ($M = 5340$ ms, $SD = 1427$). No other effect approached significance (ps > 0.50).

Conclusion

In support of the predictions, ego involvement moderated the effect of participants' affective expectations about the presented photos: Assimilation to the positive expectation only occurred when ego involvement was low but not when it was high. Moreover, high ego involvement also led to

[1] We presented the following IAPS pictures from the upper range of the hedonically neutral pictures: 1450, 1640, 2500, 2560, 5250, 5390, 5410, 5900, 7284, 7285, 8280, and 8465. The valence scores of these pictures range from 5.59 to 6.38 on a 9-point scale.

significantly slower evaluations, suggesting a more scrutinized stimulus processing.

Experiment 2: Mood experience

We conducted a conceptual replication of the first study in order to be able to generalize the findings. Therefore, we used a different type of stimulus (an essay), assessed a different type of affect (mood), and recruited men for this study. Additionally, we also assessed verbal manipulation checks.

Method

Participants and design

Forty University students (different majors, all men, average age 23 years) voluntarily participated and were randomly assigned to a 2 (ego involvement: low versus high) × 2 (expectation: no-expectation versus positive expectation) between-persons design.

Materials and procedure

The experimental session was again computerized. After having provided informed consent and biographical data, participants in the *high-ego-involvement* condition read that the study would be a test of their social perception and evaluation abilities. Moreover, it was explained that the ability to perceive social situations fast and accurately would be a social competence that was beneficial in various life domains, for instance career development and efficient leadership. To underline the test character in this condition, the text was preceded by the University logo and the title "Social Perception Test." Participants in the *low-ego-involvement* condition did not receive this bogus information. Then participants in the *no-expectation* condition received the mere instruction to read a short text that would follow and to answer some questions afterwards. Participants in the *positive-expectation* condition read in addition that the text had pleased most other participants because it was funny and enjoyable to read.

The manipulations were followed by the presentation of a short text (300 words)—an excerpt of an essay entitled "On the road with the family" (Kishon 1976) describing the communication between the author and his wife during car rides. In a pretest with 7 men, the average amusingness rating on a 7-point scale was $M = 4.00$ ($SD = 1.31$)—the scale's midpoint. Thus, we considered the text to be hedonically neutral. To facilitate readability, participants received a printed version of the essay and were informed that they would have 2 min to read the text. They started reading after a start signal (a "beep") and stopped after a stop signal (another "beep").

Then participants made their ratings by pressing a number key on the computer keyboard. First, we assessed the main dependent variable—momentarily experienced affect—with the positive (happy, joyful, contented, cheerful) and negative (sad, frustrated, depressed, dissatisfied) hedonic tone scales of the UWIST mood adjective checklist (Matthews et al. 1990). Participants rated the adjectives ("Momentarily I'm feeling….") on scales ranging from *not at all* (1) to *very much* (7). The experimental software also registered response latencies defined as the time between adjective onset on the screen and response entering. Next, we assessed verbal manipulation checks of the expectation ("The text corresponded to my expectations"; "I was surprised about the text") and ego involvement manipulations ("To what extent was it worthwhile to understand the described situation accurately?"; "To what extent was it worthwhile to be able to evaluate the described persons and their relationship?"). The rating scales ranged from *not at all* (1) to *very much* (7). Finally, participants were thanked for their participation and debriefed.

Results and discussion

Manipulation checks

The surprise and expectation ratings were negatively correlated, $r(40) = -0.49$, $p < 0.001$, and therefore averaged to an expectation index after recoding of the surprise rating. A 2 (ego involvement) × 2 (expectation) ANOVA revealed only a significant expectation main effect, $F(1,36) = 10.97$, $p < 0.002$, $\eta^2 = 0.23$, indicating more positive expectations in the positive-expectation condition ($M = 3.48$, $SD = 1.14$ vs. $M = 2.40$, $SD = 0.87$). A 2 × 2 ANOVA of the correlated, $r(40) = 0.58$, $p < 0.001$, and therefore averaged value of success ratings found only a significant ego involvement main effect, $F(1,36) = 4.62$, $p < 0.04$, $\eta^2 = 0.11$, reflecting a higher value of success in the high-ego-involvement condition ($M = 5.03$, $SD = 1.12$ vs. $M = 4.15$, $SD = 1.38$). These results reflect efficient manipulations of both independent variables.

Mood

Both the positive and negative affect sum scales showed high internal consistency (both Cronbach's $\alpha > 0.83$). Because this study focused on positive affect, we considered the two scales separately with positive affect as the primary variable of interest. A 2 (ego involvement) × 2 (expectation) × 2 (affect scale) mixed model ANOVA

with repeated measures on the last factor revealed a significant three-way interaction, $F(1,36) = 5.12$, $p < 0.03$, $\eta^2 = 0.12$, that was further explored with separate 2 (ego involvement) × 2 (expectation) between-persons ANOVAs of the positive and negative affect scores. The analysis of positive affect revealed a marginally significant expectation main effect, $F(1,36) = 3.26$, $p < 0.08$, $\eta^2 = 0.08$, indicating a trend to higher scores in the positive-expectation condition (Ms = 20.05 vs. 18.00). Most relevant, this effect was qualified by the expected significant interaction, $F(1,36) = 11.49$, $p < 0.002$, $\eta^2 = 0.24$. For the low-ego-involvement condition, positive affect was significantly more intense in the positive-expectation cell ($M = 21.90$, $SD = 3.48$) than in the no-expectation cell ($M = 16.00$, $SD = 4.32$), $t(36) = 3.67$, $p < 0.001$, $r = 0.52$, indicating an expectation assimilation effect (see Fig. 2). Cell means in the high-ego-involvement condition pointed into the opposite direction, suggesting an expectation contrast effect. However, the difference between the positive-expectation ($M = 18.20$, $SD = 3.12$) and the no-expectation cells ($M = 20.00$, $SD = 3.33$) was not significant, $t(36) = 1.12$, $p < 0.27$, $r = 0.18$.

A 2 × 2 ANOVA of the negative affect scores found no significant effects (all ps > 0.27; average negative affect score $M = 24.30$, $SD = 3.89$). In summary, these results demonstrate again that ego involvement moderated the affective expectation effect, this time with a trend to a net contrast effect when ego involvement was high.

Response latencies

We analyzed the non-transformed average response latencies for the items of the negative and positive affect scales (both were normally distributed). 2 × 2 ANOVAs found no significant effects (ps > 0.14). Nevertheless, for both scales, response latencies were longer in the high-ego-involvement condition (positive affect $M = 4605$ ms, $SD = 2492$; negative affect $M = 4439$ ms, $SD = 2429$) than in the low-ego-involvement condition (positive affect $M = 3932$ ms, $SD = 1868$; negative affect $M = 3427$ ms, $SD = 1766$).

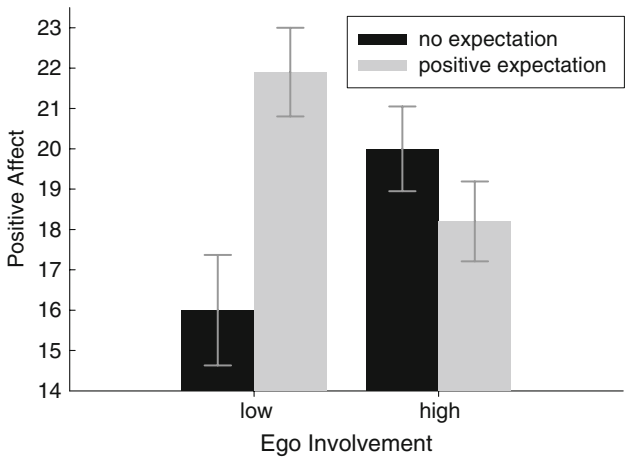

Fig. 2 Cell means and standard errors of the positive affect ratings in the conditions of Experiment 2. Higher mean values indicate more intense positive affect

Meta analysis of response latencies

As reported above, ego involvement had a significant effect on the response latencies in Study 1 but not in Study 2—although high ego involvement also led to longer processing latencies in the latter study. Therefore, we used the adding z-method (Rosenthal 1978) to run a combined analysis of the ego involvement effects on the evaluation processing latencies in Study 1 and the latencies for participants' ratings of the positive mood scale in Study 2, on which ego involvement and affective expectations had a significant effect. We converted the p-level of each comparison to its associated z-score, summed the z-scores, and divided the sum by the square root of the number of inference tests. The adding z-method revealed the predicted ego involvement effect: When ego involvement was high, the processing latencies were significantly longer than when ego involvement was low, $z = 2.28$, $p < 0.02$.

General discussion

The present experiments support the idea that ego involvement neutralizes the assimilation effect of positive affective expectations. As suggested by the AEM (Wilson and Klaaren 1992), positive affective expectations led to more positive hedonic evaluations of neutral pictures (Study 1) and to a more positive mood after reading a hedonically neutral short essay (Study 2) when ego involvement was low. This conceptually replicated finding adds to the existing evidence for assimilation effects to affective expectations (Geers and Lassiter 1999, 2002, 2003; Klaaren et al. 1994; Lee et al. 2006; Wilson et al. 1989). Most relevant, in both of the present studies this assimilation effect disappeared when ego involvement was high. Moreover, compared to low ego involvement, high ego involvement led to significantly longer response latencies on the affective ratings (Study 1) and to higher value of success ratings (Study 2). Furthermore, a combined analysis of the response latencies in both studies revealed that the combined processing latencies in the high ego involvement condition were significantly longer than the latencies in the low ego involvement condition. Taken together, this supports our idea that ego involvement justifies high mental effort (Gendolla and Richter 2005, 2006),

which is necessary to detect discrepancies between expectations and reality. By this way ego involvement neutralizes affective expectations. However, despite the fact that some previous studies found evidence for significant affective contrast effects due to increased processing effort (e.g., Geers and Lassiter 1999), the present studies did not. Nevertheless, the affective assimilation effect was significantly reduced in the high ego involvement condition of both studies, and Study 2 found at least a trend towards a contrast effect.

The equivocal evidence for affective contrast suggests that the strength of this effect may depend on more factors than *merely* recognizing a discrepancy between expectation and reality—it is possible that significant contrast effects necessitate recognizing a *large* discrepancy (see Stapel and Suls 2007, for an overview). Affective contrast seems to be the result of a comparison between a stimulus and a reference value, such as a mood inducing event (Abele and Gendolla 1999), alternatives to reality (Markman and McMullen 2003; McMullen 1997), the expected function of a judgment object (Martin et al. 1997), or an affective expectation (Geers and Lassiter 1999). However, as known for long (Sherif and Hovland 1961), one of the critical variables that determines if comparisons result in significant net contrast effects is the extent of the detected discrepancy between a stimulus and its reference value (e.g., Herr 1986; Manis et al. 1988). Accordingly, significant affective contrast effects should be particularly likely when a *large* discrepancy between an affective expectation and a stimulus' affective potential is detected—for instance in the case of a positive affective expectation about a highly aversive stimulus, which was not the case in the present study. From this perspective, the present expectation neutralization effects can be regarded as the outcome of a contrast producing process, instigated by a comparison between the stimuli and a reference value—participants' affective expectation. But given that the actual discrepancies between participants' expectations and the stimuli's "real" valence were rather small—positive expectations for hedonically neutral but not aversive stimuli—the net effect was also relatively small and emerged as expectation neutralization rather than a significant contrast effect. Consequently, we have to let it to future studies to manipulate larger discrepancies between affective expectations and stimuli's real valence to test if ego involvement results in significant contrast effect—which is strongly suggested by the results of the present Study 2.

Another explanation for the effect that ego involvement neutralized the affective assimilation effect could be that our ego involvement manipulation induced an affective state instead of manipulating processing effort. From this perspective, the performance consequences for participants' self-esteem in the high-ego-involvement condition could have induced a state of worry, anxiety, or even anger, resulting in an affect-congruency effect leading to less positive evaluations (cf. Curtis and Locke 2007; Lerner and Keltner 2000). However, two reasons speak against this interpretation. First, our previous studies have clearly shown that the present ego involvement manipulation had replicated effects on effort mobilization. Second, those studies have included measures of participants' affective states in response to the ego involvement manipulation. However, none of those studies found any evidence for increased worry, anxiety, or another negative feeling in response to the ego involvement manipulation (Gendolla 1999; Gendolla and Richter 2005, 2006). Moreover, it is of note that participants took longer to make their affect ratings in the present high ego involvement conditions, reflecting longer—and thus more effortful—processing. Consequently, we attribute the here presented effects of ego involvement to increased processing effort rather than an affect congruency effect.

In this context it is also of note that the present ego involvement effects appear to be in contradiction to the finding that ego involvement is frequently associated with superficial processing (see Utman 1997). An explanation for this discrepancy could be that our ego involvement manipulation did not lead to anxiety or worry, which can impair performance (Ryan, personal communication). Consequently, ego involvement had only its positive effect to justify relatively high processing effort that resulted in reduced assimilation effects to participants' affective expectations. The reason for this could be that our ego involvement manipulation did not only target on ability evaluation but also highlighted performance criteria.[2]

In a broader perspective of motivation and information processing, it is interesting that the present effects of ego involvement on affective expectations are similar to the effects of personal relevance manipulations in research on persuasion and attitude change. In that domain, it has been shown that personally relevant attitude issues lead to higher elaboration of persuasive messages—that is, to the mobilization of more mental effort (see Petty and Wegener 1998, for a review). In attitude research, the outcome of message elaboration depends then on argument quality. The result can be persuasion (i.e., assimilation to the persuasive message) in the case of high argument quality or non-persuasion (i.e., contrast to the persuasive message) in the case of low argument quality. This appears to be compatible with the here demonstrated effects of ego involvement on affective experiences: Personal

[2] We are indebted to Richard M. Ryan for providing this explanation that provides a facility to reconcile our findings with other documented ego involvement effects on performance.

involvement justifies high mental effort resulting in more thorough affective processing.

Another interesting outlook from the present studies pertains to cognitive emotion theories, especially appraisal theories. In this theoretical perspective, researchers highly agree that individuals' reactions to affective stimuli are influenced by top–down information processing—that is, subjective evaluations of affective stimuli and the context in which they occur (see Kappas 2006, for a recent review). Interestingly, appraisal theories put emphasis on the role of the personal importance of stimuli and events as a necessary (Arnold 1960), amplifying (Lazarus 1991; Smith and Lazarus 1990), or moderating (Scherer 2001) variable for emotional reactions. The present findings suggest that personal importance results in more effortful and thus more accurate processing of affective stimuli—an aspect that, to date, has not been considered in appraisal theories of emotions.

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